311

PRELIMINARY RESULTS OF THE CHILEAN TRAVERSE FROM PATRIOT HILLS TO SOUTH POLE 2004

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A Chilean scientific traverse from Patriot Hills to South Pole and back to Patriot Hills was carried out in 2004, as a contribution of Chile, in collaboration with Brazil, to the ITASE programme. Ice depth soundings of over 3000 m in depth were recorded on the way south by means of a 150 MHz ice depth radar on loan from the University of Kansas, USA. During the return on the way north high resolution radar soundings were performed of the top ~60 m firn layers of the glacier by means of a GSSI SIR 3000 400 MHz snow accumulation radar identical to a crevasse detection radar mounted on the tractor. Precise positioning control was provided by dual-frequency GPS receivers on loan from The Ohio State University, USA. 54 stakes were deployed along the route, being measured by dual-frequency GPS on the way south and again on the way back north for deriving glacier velocities. Base GPS data were available from Patriot Hills and from South Pole. Every 10 km along the route gravity measurements were performed with a Lacoste/Romberg model G gravity meter, which in combination with the radar ice depth data will allow to characterise the crustal structure along the transect, as well as provide data for geoid determination. Firn cores of a depth ranging from 4 m to 46 m were drilled with an electro-mechanical drill every 2 degrees of latitude, with a total of 225 m of firn samples which will be analysed for their chemical composition. In addition 105 surface snow samples were collected every 10 km along the route under clean conditions and every 20 km the surface snow density (top ~1.2 m layer) was measured with a Monte Rosa snow sampler. The general data collected by the expedition will be presented. Detailed GPS data of the positions of stakes and the position and elevation of tractor tracks on the way south and back north will be compared. The GPS data, in combination with Radarsat data, will allow performing a study of glacier flow and surface roughness along the route, including the description of areas of fast ice flow on Institute and Foundation ice streams.